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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,030	12/18/2006	Ryoichi Ohara	291682US2RDPCT	4797

22850 7590 06/18/2008

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EXAMINER	
ROSENAU, DEREK JOHN	

ART UNIT	PAPER NUMBER
2834	

NOTIFICATION DATE	DELIVERY MODE
06/18/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/581,030	OHARA ET AL.	
	Examiner	Art Unit	
	Derek J. Rosenau	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/30/06 8/14/06 9/6/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1 and 5 are objected to because of the following informalities: it appears that "an upper electrode provided on the piezoelectric film, including" should be followed by a colon instead of a semicolon. Appropriate correction is required.

2. Claim 5 is objected to because of the following informalities: the phrase "so as to connect to one of sides" is grammatically incorrect. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruby et al. (US 6714102) in view of Onishi et al. (US 722105).

5. With respect to claim 1, Ruby et al. discloses a thin film piezoelectric resonator (Fig 1) comprising: a substrate (item 110) having a cavity which penetrates through from the principal surface to the bottom surface thereof (Fig 1); a lower electrode (item 106) provided on the principal surface of the substrate so as to cover the cavity (Fig 1); A piezoelectric film (item 102) provided on the lower electrode so as to be located above the cavity (Fig 1); and an upper electrode (item 104) provided on the piezoelectric film, including: a main portion (portion of upper electrode directly above the cavity) which overlaps a part of the cavity in a plan view (Fig 1); a protruding portion (portion of upper

electrode to the left of the main portion), which is connected to the main portion, a part of which overlaps the cavity and the remaining part thereof does not overlap the cavity but overlaps the lower electrode (Fig 1); an extension portion (portion of upper electrode to right of the main portion) provided at the opposite side of the main portion from the protruding portion (Fig 1); a connecting portion (a portion of the upper electrode between the main portion and extension portion), which connected the main portion and the extension portion, provided so that at least part thereof does not overlap the cavity but overlaps the lower electrode (Fig 1).

Ruby et al. does not discloses expressly that the length of the protruding portion in a direction perpendicular to a direction connecting to the main portion being substantially the same as the length of the connection portion in a direction perpendicular to a direction of connecting to the main portion.

Onishi et al. teaches a thin film piezoelectric resonator in which the length of the protruding portion (item 2c) in a direction perpendicular to a direction connecting to the main portion (item 1) being substantially the same as the length of the connection portion (item 2b) in a direction perpendicular to a direction of connecting to the main portion (Fig 9).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the equal-length protruding and connecting portions of Onishi et al. with the thin-film piezoelectric resonator of Ruby et al. for the benefit of simplifying the design of the device.

6. With respect to claim 2, the combination of Ruby et al. and Onishi et al. discloses the thin-film piezoelectric resonator as claimed in claim 1. Onishi et al. discloses that the remaining part of the protruding portion and the part of the connecting portion are placed symmetrically with respect to a center line of the cavity (column 22, line 47 through column 23, line 3).

7. With respect to claim 3, the combination of Ruby et al. and Onishi et al. discloses the thin-film piezoelectric resonator as claimed in claim 1. Onishi et al. discloses that the remaining part of the protruding portion and the part of the connecting portion are placed asymmetrically with respect to a center line of the cavity (column 22, line 47 through column 23, line 3).

8. With respect to claim 4, the combination of Ruby et al. and Onishi et al. discloses the thin-film piezoelectric resonator as claimed in claim 1. Ruby et al. discloses that the length of the protruding portion in a direction perpendicular to a direction of connecting to the main portion is smaller than the length of the main portion in a direction perpendicular to a direction of connecting to the protruding portion (Fig 1).

9. With respect to claim 5, Ruby et al. discloses a thin film piezoelectric resonator (Fig 1) comprising: a substrate (item 110) having a cavity which penetrates through from the principal surface to the bottom surface thereof (Fig 1); a lower electrode (item 106) provided on the principal surface of the substrate so as to cover the cavity (Fig 1); A piezoelectric film (item 102) provided on the lower electrode so as to be located above the cavity (Fig 1); and an upper electrode (item 104) provided on the piezoelectric film,

including: a main portion (portion of upper electrode directly above the cavity) which overlaps a part of the cavity in a plan view (Fig 1).

Ruby et al. does not disclose expressly that the upper electrode includes a first portion provided so as to connect to one of sides of the main portion, a second portion provided as to connect to the other one of the sides of the main portion, and a link portion linking the first portion and the second portion, the link portion not overlapping the lower electrode in a plan view, or that the length of the first portion in a direction perpendicular to a direction of connecting to the main portion is substantially the same as the length of the second portion in a direction perpendicular to a direction of connecting to the main portion.

Onishi et al. teaches a thin-film piezoelectric resonator in which the upper electrode includes a first portion (Fig 9, item 2c) provided so as to connect to one of sides of the main portion, a second portion (item 2b) provided as to connect to the other one of the sides of the main portion, and a link portion (item 5) linking the first portion and the second portion, the link portion not overlapping the lower electrode in a plan view (Figs 8A-8C and 10A-10C), and that the length of the first portion in a direction perpendicular to a direction of connecting to the main portion is substantially the same as the length of the second portion in a direction perpendicular to a direction of connecting to the main portion (Fig 9).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the first, second, and link portions as well as the equal-length first

and second portions of Onishi et al. with the thin-film piezoelectric resonator of Ruby et al. for the benefit of creating redundant connections to the upper electrode.

10. With respect to claim 6, the combination of Ruby et al. and Onishi et al. discloses the thin-film piezoelectric resonator as claimed in claim 5. Onishi et al. discloses that the remaining part of the protruding portion and the part of the connecting portion are placed symmetrically with respect to a center line of the cavity (column 22, line 47 through column 23, line 3).

11. With respect to claim 7, the combination of Ruby et al. and Onishi et al. discloses the thin-film piezoelectric resonator as claimed in claim 5. Onishi et al. discloses that the remaining part of the protruding portion and the part of the connecting portion are placed asymmetrically with respect to a center line of the cavity (column 22, line 47 through column 23, line 3).

12. With respect to claim 8, the combination of Ruby et al. and Onishi et al. discloses the thin-film piezoelectric resonator as claimed in claim 5. Ruby et al. discloses that the length of the protruding portion in a direction perpendicular to a direction of connecting to the main portion is smaller than the length of the main portion in a direction perpendicular to a direction of connecting to the protruding portion (Fig 1).

13. With respect to claim 9, the combination of Ruby et al. and Onishi et al. discloses the thin-film piezoelectric resonator as claimed in claim 1. Ruby et al. discloses a filter circuit comprising thin-film piezoelectric resonators (column 1, lines 7-17).

14. With respect to claim 10, the combination of Ruby et al. and Onishi et al. discloses the filter circuit as claimed in claim 9. Onishi et al. discloses that the remaining

part of the protruding portion and the part of the connecting portion are placed symmetrically with respect to a center line of the cavity (column 22, line 47 through column 23, line 3).

15. With respect to claim 11, the combination of Ruby et al. and Onishi et al. discloses the filter circuit as claimed in claim 9. Onishi et al. discloses that the remaining part of the protruding portion and the part of the connecting portion are placed asymmetrically with respect to a center line of the cavity (column 22, line 47 through column 23, line 3).

16. With respect to claim 12, the combination of Ruby et al. and Onishi et al. discloses the filter circuit as claimed in claim 9. Ruby et al. discloses that the length of the protruding portion in a direction perpendicular to a direction of connecting to the main portion is smaller than the length of the main portion in a direction perpendicular to a direction of connecting to the protruding portion (Fig 1).

17. With respect to claim 13, the combination of Ruby et al. and Onishi et al. discloses the thin-film piezoelectric resonator as claimed in claim 5. Ruby et al. discloses a filter circuit comprising thin-film piezoelectric resonators (column 1, lines 7-17).

18. With respect to claim 14, the combination of Ruby et al. and Onishi et al. discloses the filter circuit as claimed in claim 13. Onishi et al. discloses that the remaining part of the protruding portion and the part of the connecting portion are placed symmetrically with respect to a center line of the cavity (column 22, line 47 through column 23, line 3).

19. With respect to claim 15, the combination of Ruby et al. and Onishi et al. discloses the filter circuit as claimed in claim 13. Onishi et al. discloses that the remaining part of the protruding portion and the part of the connecting portion are placed asymmetrically with respect to a center line of the cavity (column 22, line 47 through column 23, line 3).

20. With respect to claim 16, the combination of Ruby et al. and Onishi et al. discloses the filter circuit as claimed in claim 13. Ruby et al. discloses that the length of the protruding portion in a direction perpendicular to a direction of connecting to the main portion is smaller than the length of the main portion in a direction perpendicular to a direction of connecting to the protruding portion (Fig 1).

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nagao et al. (US 20060033595) discloses a thin-film piezoelectric resonator including a substrate, lower electrode, piezoelectric film, and an upper electrode that includes a main portion, protruding portion, extension portion, and a connection portion.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is (571)272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner
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